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Seminar title: Atmospheric Nanoparticles, Air Quality and Climate Change

Abstract:

The human development of our planet has a variety of negative impacts on the composition of its atmosphere at various scales. One of these dramatic changes has been the increase in the mass concentrations of sub-micrometer particles by one to sometimes two orders of magnitude over populated areas in the Northern Hemisphere.

These atmospheric aerosols can cause serious health problems, reduce visibility, contribute to acidic deposition and material damage, but are also cooling the planet by reflecting sunlight back to space.

Atmospheric chemistry occurs within a fabric of complicated atmospheric dynamics and physics.

This interplay often results in nonlinear and often counterintuitive changes of the system when anthropogenic emissions change. A major goal of our research has been to gain a predictive understanding of the physical and chemical processes that govern the dynamics, size, and chemical composition of atmospheric aerosols.

To illustrate the advances in the experimental techniques and theoretical tools in atmospheric aerosol science we will focus on the origins of particles smaller than 100 nm and their role in the energy balance of our planet.